LNAPL Sampling Results
Lake Calumet Cluster Site, Chicago, Illinois

			Location	MW-12
			Sample ID	MW-12-FP-03022017
			Sample Date	3/2/2017
Analyte	CAS	T/D	Units	
PCBs				
Aroclor 1016	12674-11-2	N	mg/kg	< 25 UJ
Aroclor 1221	11104-28-2	N	mg/kg	< 25 UJ
Aroclor 1232	11141-16-5	N	mg/kg	< 25 UJ
Aroclor 1242	53469-21-9	N	mg/kg	< 25 UJ
Aroclor 1248	12672-29-6	N	mg/kg	**180 J**
Aroclor 1254	11097-69-1	N	mg/kg	**180 J**
Aroclor 1260	11096-82-5	N	mg/kg	< 25 UJ
SVOCs				
1,1-Biphenyl	92-52-4	N	mg/kg	< 500 U
2,2-Oxybis(1-Chloropropane)	108-60-1	N	mg/kg	< 500 U
2,4,5-Trichlorophenol	95-95-4	N	mg/kg	< 990 U
2,4,6-Trichlorophenol	88-06-2	N	mg/kg	< 990 U
2,4-Dichlorophenol	120-83-2	N	mg/kg	< 990 U
2,4-Dimethylphenol	105-67-9	N	mg/kg	< 990 U
2,4-Dinitrophenol	51-28-5	N	mg/kg	< 2000 U
2,4-Dinitrotoluene	121-14-2	N	mg/kg	< 500 U
2,6-Dinitrotoluene	606-20-2	N	mg/kg	< 500 U
2-Chloronaphthalene	91-58-7	N	mg/kg	< 500 U
2-Chlorophenol	95-57-8	N	mg/kg	< 500 U
2-Methyl-4,6-dinitrophenol	534-52-1	N	mg/kg	< 990 U
2-Methylnaphthalene	91-57-6	N	mg/kg	**1100 J**
2-Methylphenol	95-48-7	N	mg/kg	< 500 U
2-Nitroaniline	88-74-4	N	mg/kg	< 500 U
2-Nitrophenol	88-75-5	N	mg/kg	< 990 U
3,3-Dichlorobenzidine	91-94-1	N	mg/kg	< 500 U
3-Nitroaniline	99-09-2	N	mg/kg	< 990 UJ
4-Bromophenyl phenyl ether	101-55-3	N	mg/kg	< 500 U
4-Chloro-3-Methylphenol	59-50-7	N	mg/kg	< 990 U
4-Chlorophenyl phenyl ether	7005-72-3	N	mg/kg	< 500 U
4-Methylphenol	106-44-5	N	mg/kg	**3800**
4-Nitroaniline	100-01-6	N	mg/kg	< 990 UJ
4-Nitrophenol	100-02-7	N	mg/kg	< 2000 U
Acenaphthene	83-32-9	N	mg/kg	**120 J**
Acenaphthylene	208-96-8	N	mg/kg	< 99 U
Acetophenone	98-86-2	N	mg/kg	**1100 J**
Anthracene	120-12-7	N	mg/kg	< 99 U
Atrazine	1912-24-9	N	mg/kg	< 990 U
Benzaldehyde	100-52-7	N	mg/kg	< 2000 UJ
Benzo(a)anthracene	56-55-3	N	mg/kg	**61 J**
Benzo(a)pyrene	50-32-8	N	mg/kg	< 99 U
Benzo(b)fluoranthene	205-99-2	N	mg/kg	**60 J**
Benzo(g,h,i)perylene	191-24-2	N	mg/kg	< 99 U
Benzo(k)fluoranthene	207-08-9	N	mg/kg	< 99 U
bis(2-Chloroethoxy)methane	111-91-1	N	mg/kg	< 500 U
bis(2-Chloroethyl)ether	111-44-4	N	mg/kg	< 500 U
bis(2-Ethylhexyl)phthalate	117-81-7	N	mg/kg	**420 J**
Butyl benzyl phthalate	85-68-7	N	mg/kg	< 500 U
Caprolactam	105-60-2	N	mg/kg	< 990 U

LNAPL Sampling Results
Lake Calumet Cluster Site, Chicago, Illinois

			Location	MW-12
			Sample ID	MW-12-FP-03022017
			Sample Date	3/2/2017
Analyte	CAS	T/D	Units	
Carbazole	86-74-8	N	mg/kg	< 500 U
Chrysene	218-01-9	N	mg/kg	**71 J**
Dibenzo(a,h)anthracene	53-70-3	N	mg/kg	< 99 U
Dibenzofuran	132-64-9	N	mg/kg	< 500 U
Diethyl phthalate	84-66-2	N	mg/kg	< 500 U
Dimethyl phthalate	131-11-3	N	mg/kg	< 500 U
Di-n-butyl phthalate	84-74-2	N	mg/kg	< 500 U
Di-n-octyl phthalate	117-84-0	N	mg/kg	< 500 U
Fluoranthene	206-44-0	N	mg/kg	**160 J**
Fluorene	86-73-7	N	mg/kg	**150 J**
Hexachloro-1,3-butadiene	87-68-3	N	mg/kg	< 500 U
Hexachlorobenzene	118-74-1	N	mg/kg	< 200 U
Hexachlorocyclopentadiene	77-47-4	N	mg/kg	< 2000 UJ
Hexachloroethane	67-72-1	N	mg/kg	< 500 U
Indeno(1,2,3-cd)pyrene	193-39-5	N	mg/kg	< 99 U
Isophorone	78-59-1	N	mg/kg	< 500 U
Naphthalene	91-20-3	N	mg/kg	**1200 J**
Nitrobenzene	98-95-3	N	mg/kg	< 99 U
N-Nitrosodi-n-propylamine	621-64-7	N	mg/kg	< 500 U
N-Nitrosodiphenylamine	86-30-6	N	mg/kg	< 500 U
p-Chloroaniline	106-47-8	N	mg/kg	< 990 U
Pentachlorophenol	87-86-5	N	mg/kg	< 2000 U
Phenanthrene	85-01-8	N	mg/kg	**460 J**
Phenol	108-95-2	N	mg/kg	< 500 U
Pyrene	129-00-0	N	mg/kg	**180 J**
VOCs				
1,1,1-Trichloroethane	71-55-6	N	mg/kg	< 5.0 U
1,1,2,2-Tetrachloroethane	79-34-5	N	mg/kg	< 5.0 U
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	N	mg/kg	< 5.0 U
1,1,2-Trichloroethane	79-00-5	N	mg/kg	< 5.0 U
1,1-Dichloroethane	75-34-3	N	mg/kg	**69**
1,1-Dichloroethene	75-35-4	N	mg/kg	< 5.0 U
1,2,4-Trichlorobenzene	120-82-1	N	mg/kg	< 5.0 U
1,2-Dibromo-3-chloropropane	96-12-8	N	mg/kg	< 25 U
1,2-Dibromoethane	106-93-4	N	mg/kg	< 5.0 U
1,2-Dichlorobenzene	95-50-1	N	mg/kg	< 5.0 U
1,2-Dichloroethane	107-06-2	N	mg/kg	< 5.0 U
1,2-Dichloropropane	78-87-5	N	mg/kg	< 5.0 U
1,3-Dichlorobenzene	541-73-1	N	mg/kg	< 5.0 U
1,4-Dichlorobenzene	106-46-7	N	mg/kg	< 5.0 U
2-Butanone (MEK)	78-93-3	N	mg/kg	< 25 U
4-Methyl-2-Pentanone	108-10-1	N	mg/kg	**250**
Acetone	67-64-1	N	mg/kg	< 25 U
Benzene	71-43-2	N	mg/kg	**18**
Bromodichloromethane	75-27-4	N	mg/kg	< 5.0 U
Bromoform	75-25-2	N	mg/kg	< 5.0 UJ
Bromomethane	74-83-9	N	mg/kg	< 10 UJ
Carbon Disulfide	75-15-0	N	mg/kg	< 10 U
Carbon Tetrachloride	56-23-5	N	mg/kg	< 5.0 U

LNAPL Sampling Results
Lake Calumet Cluster Site, Chicago, Illinois

			Location	MW-12
			Sample ID	MW-12-FP-03022017
			Sample Date	3/2/2017
Analyte	CAS	T/D	Units	
CFC-11	75-69-4	N	mg/kg	< 5.0 U
CFC-12	75-71-8	N	mg/kg	< 10 U
Chlorobenzene	108-90-7	N	mg/kg	< 5.0 U
Chlorodibromomethane	124-48-1	N	mg/kg	< 5.0 U
Chloroethane	75-00-3	N	mg/kg	< 5.0 UJ
Chloroform	67-66-3	N	mg/kg	< 10 U
Chloromethane	74-87-3	N	mg/kg	< 5.0 U
cis-1,2-Dichloroethene	156-59-2	N	mg/kg	**30**
cis-1,3-Dichloropropene	10061-01-5	N	mg/kg	< 5.0 U
Cyclohexane	110-82-7	N	mg/kg	< 5.0 U
Dichloromethane	75-09-2	N	mg/kg	< 25 U
Ethylbenzene	100-41-4	N	mg/kg	**6400 D**
Isopropylbenzene	98-82-8	N	mg/kg	**170**
Methyl Acetate	79-20-9	N	mg/kg	< 25 U
Methyl N-Butyl Ketone (2-Hexanone)	591-78-6	N	mg/kg	< 25 U
Methylcyclohexane	108-87-2	N	mg/kg	**46**
Methyl-tert-butylether	1634-04-4	N	mg/kg	< 5.0 U
Styrene (Monomer)	100-42-5	N	mg/kg	< 5.0 U
Tetrachloroethene	127-18-4	N	mg/kg	**240**
Toluene	108-88-3	N	mg/kg	**4400 D**
Total Xylenes	1330-20-7	N	mg/kg	**23000 D**
trans-1,2-Dichloroethene	156-60-5	N	mg/kg	< 5.0 U
trans-1,3-Dichloropropene	10061-02-6	N	mg/kg	< 5.0 U
Trichloroethene	79-01-6	N	mg/kg	**69**
Vinyl chloride	75-01-4	N	mg/kg	**7.7**

Notes

mg/kg	milligram per kilogram
PCBs	polychlorinated biphenyls
SVOCs	semi-volatile organic compounds
VOCs	volatile organic compounds
J	compound was identified; result is an estimated value
U	compound was not detected; result is the compound quantitation limit
UJ	compound not detected above quantitation limit; reported limit is approximate
D	concentration is based on a diluted sample

Lake Calumet Cluster Site

DATA REVIEW

Chicago, Illinois

Volatile Organic Compounds (VOCs), Semivolatile Organic Compounds (SVOCs), and Polychlorinated Biphenyls (PCBs) Analyses

SDG #500-124554-1

Analyses Performed By:
TestAmerica Laboratories, Inc.
Chicago, Illinois

Report #27457R
Review Level: Tier III
Project: CI001805.0002.00005

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #500-124554-1 for samples collected in association with the Lake Calumet Cluster Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chains of custody. Analyses were performed on the following samples:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis					
						VOC	SVOC	PCB	MET	MISC	Dslvd Gases
500-124554-1	MW-12-FP-03022017	500-124554-1	Waste	03/02/2017		X	X	X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance (QA) or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8260B, 8270D, and 8082A. Data were reviewed in accordance with *USEPA National Functional Guidelines for Organic Data Review* (October 1999).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected; the analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260C	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.
	Soil/Waste	48 hours from collection to extraction and 14 days from extraction to analysis	Cool to <6 °C.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Target compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and system performance and column resolution were acceptable. All analyses were performed within 12 hours of the associated tune analysis.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument can produce acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration Verification (CCV)

Each target compound associated with the continuing calibration standard must exhibit a RRF value

greater than control limit (0.05) and a percent difference (%D) from the initial calibration within the control limit (20%).

All compounds associated with the calibrations were within the specified control limits, except for the compounds presented in the following table.

Samples	Initial/ Continuing	Compound	Criteria
MW-12-FP-03022017	CCV	Bromomethane	-33.9%
		Chloroethane	-41.9%
		Bromoform	-20.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibrations	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibrations	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibrations	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not performed on a sample within this SDG.

8. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

9. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL is applied to the difference between the results for water matrices.

A field duplicate was not performed on sample within this SDG.

10. Compound Identification

A positive identification of a target compound is made when the relative retention time (RRT) is within ±0.06 RRT units of the compound's RRT in the associated calibration standard and the mass spectrum of the compound matches the compound's mass spectrum in the associated calibration standard within the method-specified criteria.

All identified compounds met the specified criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
MW-12-FP-03022017	Toluene	--	4400 D	4400 D

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
	Ethylbenzene	--	6400 D	6400 D
	Xylenes, Total	--	23000 D	23000 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCS

VOCs: SW-846 8260B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Gas Chromatography/Mass Spectrometry (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
C. Trip blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision RPD	X				X
Laboratory Duplicate Sample RPD	X				X
Field Duplicate Sample RPD	X				X
Surrogate Spike %R		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:
%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270D	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to < 6 °C
	Soil/Waste	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and system performance and column resolution were acceptable. All analyses were performed within 12 hours of the associated tune analysis.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument can produce acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference

(%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/ Continuing	Compound	Criteria
MW-12-FP-03022017	ICV %RSD	Benzaldehyde	28.4%
	CCV %D	Benzaldehyde	-75.5%
		Hexachlorocyclopentadiene	-20.7%
		4-Nitroaniline	-25.5%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:
[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
MW-12-FP-03022017	Phenol-d6	>UL
	2-Fluorophenol	<LL but > 10%
	2,4,6-Tribromophenol	AC
	Nitrobenzene-d5	>UL
	2-Fluorobiphenyl	>UL
	Terphenyl-d14	AC

Notes:
LL = Lower control limit
AC = Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant fraction are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Non-detect	J[1]
	Detect	

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the SVOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a

factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample associated with these SDGs.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the LCS and LCSD results must be within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
MW-12-FP-03022017	3-Nitroaniline	<LL but >10%	<LL but >10%
	4-Nitroaniline	<LL but >10%	<LL but >10%
	Carbazole	<LL but >10%	<LL but >10%

AC = acceptable

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL is applied to the difference between the results for water matrices.

A field duplicate was not performed on sample within this SDG.

10. Compound Identification

A positive identification of a target compound is made when the relative retention time (RRT) is within ±0.06 RRT units of the compound's RRT in the associated calibration standard and the mass spectrum of

the compound matches the compound's mass spectrum in the associated calibration standard within the method-specified criteria.

All identified compounds met the specified criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
MW-12-FP-03022017	3 & 4 Methylphenol	--	3800 D	3800 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCS

SVOCs: SW-846 8270D	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Gas Chromatography/Mass Spectrometry (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Laboratory Duplicate Sample RPD	X				X
Field Duplicate Sample RPD	X				X
Surrogate Spike Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X	X		
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard response		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:
%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8082A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil/Waste	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Target analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument can produce acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% is allowed or a correlation coefficient greater than 0.99. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%).

All Aroclors associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that one of the two PCB surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
MW-12-FP-03022017	Tetrachloro-m-xylene	D
	Decachlorobiphenyl	D

Notes:
AC = Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant fraction are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
One surrogate exhibiting recovery outside the control limits but > 10%	Non-detect	No Action
	Detect	
Surrogates diluted below the calibration curve due to the high concentration of a target compound.	Non-detect	J[1]
	Detect	

Note:

[1]A more concentrated analysis was not performed with surrogate compounds within the calibration range; therefore, no determination of extraction efficiency could be made.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample from within these SDGs.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analyses exhibited recoveries and RPDs within the control limits.

8. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL is applied to the difference between the results for water matrices.

A field duplicate was not performed on sample within this SDG.

9. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) of detected sample results must be less than 40%.

All detected Aroclors exhibited acceptable %Ds between the primary and confirmation columns.

The laboratory reported both results from the analytical columns. Due to continuing calibration recoveries outside criteria from the confirmation column, the results from the primary column will be reported as the usable result.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PCBS

PCBs: SW-846 8082A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Gas Chromatography (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Laboratory Duplicate Sample RPD	X				X
Field Duplicate Sample RPD		X		X	
Surrogate Spike Recoveries		X	X		
Column (RPD) (If dual column is performed-not confirmation purposes only)		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation		X		X	
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation
%R - percent recovery,
RPD - relative percent difference,
%D – difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE:

DATE: April 5, 2017

PEER REVIEW: Dennis Capria

DATE: April 5, 2017

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

2417 Bond Street, University Park, IL 60484
Phone: 708.534.5200 Fax: 708.534.5211

(optional)
Report To
Contact: Jack Kratzmeyer
Company: Arcadis
Address: 200 S. Michigan Ave
Address: ste 2000
Phone: 312 - 575-3700
Fax:
E-Mail: Jack.Kratzmeyer@arcadis.com

(optional)
Bill To
Contact:
Company:
Address:
Address:
Phone:
Fax:
PO#/Reference#

Chain of Custody Record

Lab Job #: 500- 124554
Chain of Custody Number:
Page ____ of ____
Temperature °C of Cooler: 4.6

Client: Arcadis
Client Project #: CI001805.0002.00005
Project Name: LCCS
Project Location/State: Chicago, IL
Lab Project #: 50011099
Sampler: Ben Thornhoffer
Lab PM: Therese Hargraves

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	Preservative: 8 / Parameter: Waste Oil SVOC	8 / Waste Oil VOC	8 / Waste Oil PCB							Comments
1		MW-12-FP-03022017	3/2/17	10:10	3	OL	1	1	1							

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days ___ 10 Days ___ 15 Days _____ Other
Requested Due Date _____

Sample Disposal
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Ben Thornhoffer	Arcadis	3/2/2017	1134	[illegible]	TA-CHI	3/2/17	1134
Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Lab Courier ☐
Shipped ☐
Hand Delivered X

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments

Lab Comments:
500-124554 COC

03/16/2017

TAL-4124-500 (1209)

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	LCS or LCSD is outside acceptance limits.

GC Semi VOA

Qualifier	Qualifier Description
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Client Sample ID: MW-12-FP-03022017

Date Collected: 03/02/17 10:10
Date Received: 03/02/17 11:34

Lab Sample ID: 500-124554-1

Matrix: Waste

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	<10		10	3.4	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Chloromethane	<5.0		5.0	1.6	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Vinyl chloride	**7.7**		2.5	1.3	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Bromomethane	<10	J	10	4.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Chloroethane	<5.0	J	5.0	2.5	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Trichlorofluoromethane	<5.0		5.0	2.1	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1-Dichloroethene	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1,2-Trichloro-1,2,2-trifluoroethane	<5.0		5.0	2.3	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Acetone	<25		25	8.7	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Carbon disulfide	<10		10	4.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methyl acetate	<25		25	10	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methylene Chloride	<25		25	8.2	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
trans-1,2-Dichloroethene	<5.0		5.0	1.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methyl tert-butyl ether	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1-Dichloroethane	**69**		5.0	2.1	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
cis-1,2-Dichloroethene	**30**		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methyl Ethyl Ketone	<25		25	11	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Chloroform	<10		10	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1,1-Trichloroethane	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Cyclohexane	<5.0		5.0	2.4	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Carbon tetrachloride	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Benzene	**18**		1.3	0.73	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dichloroethane	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Trichloroethene	**69**		2.5	0.82	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methylcyclohexane	**46**		5.0	1.6	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dichloropropane	<5.0		5.0	2.1	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Bromodichloromethane	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
cis-1,3-Dichloropropene	<5.0		5.0	2.1	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
methyl isobutyl ketone	**250**		25	11	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
trans-1,3-Dichloropropene	<5.0		5.0	1.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1,2-Trichloroethane	<5.0		5.0	1.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Tetrachloroethene	**240**		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
2-Hexanone	<25		25	7.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Dibromochloromethane	<5.0		5.0	2.4	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dibromoethane	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Chlorobenzene	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Styrene	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Bromoform	<5.0	J	5.0	2.4	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Isopropylbenzene	**170**		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1,2,2-Tetrachloroethane	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,3-Dichlorobenzene	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,4-Dichlorobenzene	<5.0		5.0	1.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dichlorobenzene	<5.0		5.0	1.7	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dibromo-3-Chloropropane	<25		25	10	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2,4-Trichlorobenzene	<5.0		5.0	1.7	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*71 - 127*	*03/05/17 17:07*	*03/13/17 14:13*	*5000*
Toluene-d8 (Surr)	*99*		*75 - 120*	*03/05/17 17:07*	*03/13/17 14:13*	*5000*

Client Sample ID: MW-12-FP-03022017

Date Collected: 03/02/17 10:10
Date Received: 03/02/17 11:34

Lab Sample ID: 500-124554-1

Matrix: Waste

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		71 - 120	03/05/17 17:07	03/13/17 14:13	5000
Dibromofluoromethane	95		70 - 120	03/05/17 17:07	03/13/17 14:13	5000

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	**4400**	D	13	7.4	mg/Kg		03/05/17 17:07	03/13/17 14:40	50000
Ethylbenzene	**6400**	D	13	9.2	mg/Kg		03/05/17 17:07	03/13/17 14:40	50000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		71 - 127	03/05/17 17:07	03/13/17 14:40	50000
Toluene-d8 (Surr)	101		75 - 120	03/05/17 17:07	03/13/17 14:40	50000
4-Bromofluorobenzene (Surr)	102		71 - 120	03/05/17 17:07	03/13/17 14:40	50000
Dibromofluoromethane	94		70 - 120	03/05/17 17:07	03/13/17 14:40	50000

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	**23000**	D	250	110	mg/Kg		03/05/17 17:07	03/14/17 11:17	500000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	105		71 - 127	03/05/17 17:07	03/14/17 11:17	500000
Toluene-d8 (Surr)	97		75 - 120	03/05/17 17:07	03/14/17 11:17	500000
4-Bromofluorobenzene (Surr)	92		71 - 120	03/05/17 17:07	03/14/17 11:17	500000
Dibromofluoromethane	94		70 - 120	03/05/17 17:07	03/14/17 11:17	500000

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzaldehyde	<2000	J	2000	990	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Phenol	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Bis(2-chloroethyl)ether	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Chlorophenol	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Methylphenol	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,2'-oxybis[1-chloropropane]	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Acetophenone	**1100**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
N-Nitrosodi-n-propylamine	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Hexachloroethane	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Nitrobenzene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Isophorone	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Nitrophenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4-Dimethylphenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Bis(2-chloroethoxy)methane	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4-Dichlorophenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Naphthalene	**1200**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Chloroaniline	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Hexachlorobutadiene	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Caprolactam	<990		990	990	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Chloro-3-methylphenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Methylnaphthalene	**1100**	J	500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Hexachlorocyclopentadiene	<2000	J	2000	1000	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4,6-Trichlorophenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4,5-Trichlorophenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10

Client Sample ID: MW-12-FP-03022017

Date Collected: 03/02/17 10:10
Date Received: 03/02/17 11:34

Lab Sample ID: 500-124554-1

Matrix: Waste

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Chloronaphthalene	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Nitroaniline	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Dimethyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,6-Dinitrotoluene	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Acenaphthylene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
3-Nitroaniline	<990	J	990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Acenaphthene	**120**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4-Dinitrophenol	<2000		2000	1000	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Nitrophenol	<2000		2000	1000	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Dibenzofuran	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4-Dinitrotoluene	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Diethyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Fluorene	**150**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Chlorophenyl phenyl ether	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Nitroaniline	<990	J	990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4,6-Dinitro-2-methylphenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
N-Nitrosodiphenylamine	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Bromophenyl phenyl ether	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Hexachlorobenzene	<200		200	100	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Atrazine	<990		990	990	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Pentachlorophenol	<2000		2000	1000	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Phenanthrene	**460**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Anthracene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Carbazole	<500	J	500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Di-n-butyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Fluoranthene	**160**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Pyrene	**180**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Butyl benzyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
3,3'-Dichlorobenzidine	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[a]anthracene	**61**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Chrysene	**71**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Bis(2-ethylhexyl) phthalate	**420**	J	500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Di-n-octyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[b]fluoranthene	**60**	J	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[k]fluoranthene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[a]pyrene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Indeno[1,2,3-cd]pyrene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Dibenz(a,h)anthracene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[g,h,i]perylene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*36*	*X*	*40 - 130*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
Phenol-d5 (Surr)	*226*	*X*	*36 - 123*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
Nitrobenzene-d5 (Surr)	*166*	*X*	*33 - 124*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
2-Fluorobiphenyl (Surr)	*120*	*X*	*42 - 115*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
2,4,6-Tribromophenol (Surr)	*102*		*25 - 130*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
Terphenyl-d14 (Surr)	*126*		*25 - 150*	*03/07/17 21:45*	*03/08/17 18:51*	*10*

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Client Sample ID: MW-12-FP-03022017

Date Collected: 03/02/17 10:10
Date Received: 03/02/17 11:34

Lab Sample ID: 500-124554-1

Matrix: Waste

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3 & 4 Methylphenol	**3800**		2500	1200	mg/Kg		03/07/17 21:45	03/08/17 17:55	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*0*	*D*	*40 - 130*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
Phenol-d5 (Surr)	*0*	*D*	*36 - 123*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
Nitrobenzene-d5 (Surr)	*0*	*D*	*33 - 124*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
2-Fluorobiphenyl (Surr)	*0*	*D*	*42 - 115*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
2,4,6-Tribromophenol (Surr)	*0*	*D*	*25 - 130*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
Terphenyl-d14 (Surr)	*0*	*D*	*25 - 150*	*03/07/17 21:45*	*03/08/17 17:55*	*50*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	<25	UJ	25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
~~PCB-1016~~	~~<25~~		~~25~~	~~12~~	~~mg/Kg~~		~~03/07/17 14:02~~	~~03/09/17 14:05~~	~~50~~
PCB-1221	<25	UJ	25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
~~PCB-1221~~	~~<25~~		~~25~~	~~12~~	~~mg/Kg~~		~~03/07/17 14:02~~	~~03/09/17 14:05~~	~~50~~
PCB-1232	<25	UJ	25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
~~PCB-1232~~	~~<25~~		~~25~~	~~12~~	~~mg/Kg~~		~~03/07/17 14:02~~	~~03/09/17 14:05~~	~~50~~
PCB-1242	<25	UJ	25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
~~PCB-1242~~	~~<25~~		~~25~~	~~12~~	~~mg/Kg~~		~~03/07/17 14:02~~	~~03/09/17 14:05~~	~~50~~
PCB-1248	**180**	J	25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
~~**PCB-1248**~~	~~**170**~~		~~25~~	~~12~~	~~mg/Kg~~		~~03/07/17 14:02~~	~~03/09/17 14:05~~	~~50~~
PCB-1254	**180**	J	25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
~~**PCB-1254**~~	~~**150**~~		~~25~~	~~12~~	~~mg/Kg~~		~~03/07/17 14:02~~	~~03/09/17 14:05~~	~~50~~
PCB-1260	<25	UJ	25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
~~PCB-1260~~	~~<25~~		~~25~~	~~12~~	~~mg/Kg~~		~~03/07/17 14:02~~	~~03/09/17 14:05~~	~~50~~

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*0*	*D*	*62 - 121*	*03/07/17 14:02*	*03/09/17 14:05*	*50*
Tetrachloro-m-xylene	*0*	*D*	*62 - 121*	*03/07/17 14:02*	*03/09/17 14:05*	*50*
DCB Decachlorobiphenyl	*0*	*D*	*53 - 118*	*03/07/17 14:02*	*03/09/17 14:05*	*50*
DCB Decachlorobiphenyl	*0*	*D*	*53 - 118*	*03/07/17 14:02*	*03/09/17 14:05*	*50*

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

TestAmerica Job ID: 500-124554-1
Client Project/Site: Lake Calumet Cluster Site

For:
ARCADIS U.S., Inc.
200 S. Michigan Ave
Suite 2000
Chicago, Illinois 60604

Attn: Mr. Jack Kratzmeyer

Therese Hargraves

Authorized for release by:
3/16/2017 4:45:01 PM

Therese Hargraves, Project Manager I
(708)534-5200
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LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 500-124554-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative
500-124554-1

Comments
No additional comments.

Receipt
The sample was received on 3/2/2017 11:34 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
Method(s) 8260B: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-12-FP-03022017 (500-124554-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method(s) 8270D: The following analyte has been identified, in the reference method and/or via historical data, to be a poor and/or erratic performer: Benzaldehyde. This analyte may have a %D>60% if the average %D of all the analytes in the initial calibration verification (ICV) is 30%. (ICV 500-369784/13)

Method(s) 8270D: The following sample was diluted due to the nature of the sample matrix: MW-12-FP-03022017 (500-124554-1). Elevated reporting limits (RLs) are provided.

Method(s) 8270D: The following sample required a dilution due to the nature of the sample matrix: MW-12-FP-03022017 (500-124554-1). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method(s) 8270D: Due to the large number of spiked analytes, there is a high probability that one or more analytes will recover outside acceptance limits. The laboratory's SOP allows for 3 analytes to recover outside criteria for this method when utilizing this list of analytes. The LCS/LCSD associated with batch 500-374814 had 3 analytes outside control limits, biased low: 3-Nitroaniline; 4-Nitroaniline; and Carbazole. These results have been reported and qualified. (LCS 500-374814/2-A) and (LCSD 500-374814/3-A)

Method(s) 8270D: CCVIS 500-374842/2 was outside the method criteria for 4-Nitroaniline; Hexachlorobenzene, Hexachlorocyclopentadiene, and Pentachlorophenol. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analytes is considered estimated.

Method(s) 8270D: Four surrogate recoveries for the following sample were outside control limits: MW-12-FP-03022017 (500-124554-1). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method(s) 8082A: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-12-FP-03022017 (500-124554-1). Elevated reporting limits (RLs) are provided.

Method(s) 8082A: The following samples required a dilution due to the nature of the sample matrix: MW-12-FP-03022017 (500-124554-1). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method(s) 8082A: %D fell below the control limit on the confirmation column for DCB Decachlorobiphenyl surrogate, PCB-1016 peak 1, and PCB-1260 peak 1 in the following continuing calibration verification: (CCVIS 500-375068/1); however, the primary column was within control limits.

Job ID: 500-124554-1 (Continued)

Laboratory: TestAmerica Chicago (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Client Sample ID: MW-12-FP-03022017 — Lab Sample ID: 500-124554-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	7.7		2.5	1.3	mg/Kg	5000		8260B	Total/NA
1,1-Dichloroethane	69		5.0	2.1	mg/Kg	5000		8260B	Total/NA
cis-1,2-Dichloroethene	30		5.0	2.0	mg/Kg	5000		8260B	Total/NA
Benzene	18		1.3	0.73	mg/Kg	5000		8260B	Total/NA
Trichloroethene	69		2.5	0.82	mg/Kg	5000		8260B	Total/NA
Methylcyclohexane	46		5.0	1.6	mg/Kg	5000		8260B	Total/NA
methyl isobutyl ketone	250		25	11	mg/Kg	5000		8260B	Total/NA
Tetrachloroethene	240		5.0	1.9	mg/Kg	5000		8260B	Total/NA
Isopropylbenzene	170		5.0	1.9	mg/Kg	5000		8260B	Total/NA
Toluene - DL	4400		13	7.4	mg/Kg	50000		8260B	Total/NA
Ethylbenzene - DL	6400		13	9.2	mg/Kg	50000		8260B	Total/NA
Xylenes, Total - DL2	23000		250	110	mg/Kg	500000		8260B	Total/NA
Acetophenone	1100		99	50	mg/Kg	10		8270D	Total/NA
Naphthalene	1200		99	50	mg/Kg	10		8270D	Total/NA
2-Methylnaphthalene	1100		500	250	mg/Kg	10		8270D	Total/NA
Acenaphthene	120		99	50	mg/Kg	10		8270D	Total/NA
Fluorene	150		99	50	mg/Kg	10		8270D	Total/NA
Phenanthrene	460		99	50	mg/Kg	10		8270D	Total/NA
Fluoranthene	160		99	50	mg/Kg	10		8270D	Total/NA
Pyrene	180		99	50	mg/Kg	10		8270D	Total/NA
Benzo[a]anthracene	61	J	99	50	mg/Kg	10		8270D	Total/NA
Chrysene	71	J	99	50	mg/Kg	10		8270D	Total/NA
Bis(2-ethylhexyl) phthalate	420	J	500	250	mg/Kg	10		8270D	Total/NA
Benzo[b]fluoranthene	60	J	99	50	mg/Kg	10		8270D	Total/NA
3 & 4 Methylphenol - DL	3800		2500	1200	mg/Kg	50		8270D	Total/NA
PCB-1248	180		25	12	mg/Kg	50		8082A	Total/NA
PCB-1248	170		25	12	mg/Kg	50		8082A	Total/NA
PCB-1254	180		25	12	mg/Kg	50		8082A	Total/NA
PCB-1254	150		25	12	mg/Kg	50		8082A	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CHI
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CHI
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	TAL CHI

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-124554-1	MW-12-FP-03022017	Waste	03/02/17 10:10	03/02/17 11:34

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Client Sample ID: MW-12-FP-03022017

Date Collected: 03/02/17 10:10
Date Received: 03/02/17 11:34

Lab Sample ID: 500-124554-1

Matrix: Waste

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	<10		10	3.4	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Chloromethane	<5.0		5.0	1.6	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Vinyl chloride	**7.7**		2.5	1.3	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Bromomethane	<10		10	4.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Chloroethane	<5.0		5.0	2.5	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Trichlorofluoromethane	<5.0		5.0	2.1	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1-Dichloroethene	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1,2-Trichloro-1,2,2-trifluoroethane	<5.0		5.0	2.3	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Acetone	<25		25	8.7	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Carbon disulfide	<10		10	4.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methyl acetate	<25		25	10	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methylene Chloride	<25		25	8.2	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
trans-1,2-Dichloroethene	<5.0		5.0	1.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methyl tert-butyl ether	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1-Dichloroethane	**69**		5.0	2.1	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
cis-1,2-Dichloroethene	**30**		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methyl Ethyl Ketone	<25		25	11	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Chloroform	<10		10	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1,1-Trichloroethane	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Cyclohexane	<5.0		5.0	2.4	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Carbon tetrachloride	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Benzene	**18**		1.3	0.73	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dichloroethane	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Trichloroethene	**69**		2.5	0.82	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Methylcyclohexane	**46**		5.0	1.6	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dichloropropane	<5.0		5.0	2.1	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Bromodichloromethane	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
cis-1,3-Dichloropropene	<5.0		5.0	2.1	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
methyl isobutyl ketone	**250**		25	11	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
trans-1,3-Dichloropropene	<5.0		5.0	1.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1,2-Trichloroethane	<5.0		5.0	1.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Tetrachloroethene	**240**		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
2-Hexanone	<25		25	7.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Dibromochloromethane	<5.0		5.0	2.4	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dibromoethane	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Chlorobenzene	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Styrene	<5.0		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Bromoform	<5.0		5.0	2.4	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
Isopropylbenzene	**170**		5.0	1.9	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,1,2,2-Tetrachloroethane	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,3-Dichlorobenzene	<5.0		5.0	2.0	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,4-Dichlorobenzene	<5.0		5.0	1.8	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dichlorobenzene	<5.0		5.0	1.7	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2-Dibromo-3-Chloropropane	<25		25	10	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000
1,2,4-Trichlorobenzene	<5.0		5.0	1.7	mg/Kg		03/05/17 17:07	03/13/17 14:13	5000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*71 - 127*	*03/05/17 17:07*	*03/13/17 14:13*	*5000*
Toluene-d8 (Surr)	*99*		*75 - 120*	*03/05/17 17:07*	*03/13/17 14:13*	*5000*

Client Sample ID: MW-12-FP-03022017

Lab Sample ID: 500-124554-1
Date Collected: 03/02/17 10:10
Matrix: Waste
Date Received: 03/02/17 11:34

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*71 - 120*	*03/05/17 17:07*	*03/13/17 14:13*	*5000*
Dibromofluoromethane	*95*		*70 - 120*	*03/05/17 17:07*	*03/13/17 14:13*	*5000*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	**4400**		13	7.4	mg/Kg		03/05/17 17:07	03/13/17 14:40	50000
Ethylbenzene	**6400**		13	9.2	mg/Kg		03/05/17 17:07	03/13/17 14:40	50000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*71 - 127*	*03/05/17 17:07*	*03/13/17 14:40*	*50000*
Toluene-d8 (Surr)	*101*		*75 - 120*	*03/05/17 17:07*	*03/13/17 14:40*	*50000*
4-Bromofluorobenzene (Surr)	*102*		*71 - 120*	*03/05/17 17:07*	*03/13/17 14:40*	*50000*
Dibromofluoromethane	*94*		*70 - 120*	*03/05/17 17:07*	*03/13/17 14:40*	*50000*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	**23000**		250	110	mg/Kg		03/05/17 17:07	03/14/17 11:17	500000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*71 - 127*	*03/05/17 17:07*	*03/14/17 11:17*	*500000*
Toluene-d8 (Surr)	*97*		*75 - 120*	*03/05/17 17:07*	*03/14/17 11:17*	*500000*
4-Bromofluorobenzene (Surr)	*92*		*71 - 120*	*03/05/17 17:07*	*03/14/17 11:17*	*500000*
Dibromofluoromethane	*94*		*70 - 120*	*03/05/17 17:07*	*03/14/17 11:17*	*500000*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzaldehyde	<2000		2000	990	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Phenol	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Bis(2-chloroethyl)ether	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Chlorophenol	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Methylphenol	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,2'-oxybis[1-chloropropane]	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Acetophenone	**1100**		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
N-Nitrosodi-n-propylamine	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Hexachloroethane	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Nitrobenzene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Isophorone	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Nitrophenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4-Dimethylphenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Bis(2-chloroethoxy)methane	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4-Dichlorophenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Naphthalene	**1200**		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Chloroaniline	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Hexachlorobutadiene	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Caprolactam	<990		990	990	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Chloro-3-methylphenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Methylnaphthalene	**1100**		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Hexachlorocyclopentadiene	<2000		2000	1000	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4,6-Trichlorophenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4,5-Trichlorophenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10

Client Sample ID: MW-12-FP-03022017

Lab Sample ID: 500-124554-1

Date Collected: 03/02/17 10:10

Matrix: Waste

Date Received: 03/02/17 11:34

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Chloronaphthalene	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2-Nitroaniline	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Dimethyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,6-Dinitrotoluene	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Acenaphthylene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
3-Nitroaniline	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Acenaphthene	**120**		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4-Dinitrophenol	<2000		2000	1000	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Nitrophenol	<2000		2000	1000	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Dibenzofuran	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
2,4-Dinitrotoluene	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Diethyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Fluorene	**150**		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Chlorophenyl phenyl ether	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Nitroaniline	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4,6-Dinitro-2-methylphenol	<990		990	500	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
N-Nitrosodiphenylamine	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
4-Bromophenyl phenyl ether	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Hexachlorobenzene	<200		200	100	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Atrazine	<990		990	990	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Pentachlorophenol	<2000		2000	1000	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Phenanthrene	**460**		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Anthracene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Carbazole	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Di-n-butyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Fluoranthene	**160**		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Pyrene	**180**		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Butyl benzyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
3,3'-Dichlorobenzidine	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[a]anthracene	**61**	**J**	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Chrysene	**71**	**J**	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Bis(2-ethylhexyl) phthalate	**420**	**J**	500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Di-n-octyl phthalate	<500		500	250	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[b]fluoranthene	**60**	**J**	99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[k]fluoranthene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[a]pyrene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Indeno[1,2,3-cd]pyrene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Dibenz(a,h)anthracene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10
Benzo[g,h,i]perylene	<99		99	50	mg/Kg		03/07/17 21:45	03/08/17 18:51	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*36*	*X*	*40 - 130*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
Phenol-d5 (Surr)	*226*	*X*	*36 - 123*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
Nitrobenzene-d5 (Surr)	*166*	*X*	*33 - 124*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
2-Fluorobiphenyl (Surr)	*120*	*X*	*42 - 115*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
2,4,6-Tribromophenol (Surr)	*102*		*25 - 130*	*03/07/17 21:45*	*03/08/17 18:51*	*10*
Terphenyl-d14 (Surr)	*126*		*25 - 150*	*03/07/17 21:45*	*03/08/17 18:51*	*10*

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Client Sample ID: MW-12-FP-03022017

Lab Sample ID: 500-124554-1

Date Collected: 03/02/17 10:10

Matrix: Waste

Date Received: 03/02/17 11:34

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3 & 4 Methylphenol	**3800**		2500	1200	mg/Kg		03/07/17 21:45	03/08/17 17:55	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*0*	*D*	*40 - 130*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
Phenol-d5 (Surr)	*0*	*D*	*36 - 123*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
Nitrobenzene-d5 (Surr)	*0*	*D*	*33 - 124*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
2-Fluorobiphenyl (Surr)	*0*	*D*	*42 - 115*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
2,4,6-Tribromophenol (Surr)	*0*	*D*	*25 - 130*	*03/07/17 21:45*	*03/08/17 17:55*	*50*
Terphenyl-d14 (Surr)	*0*	*D*	*25 - 150*	*03/07/17 21:45*	*03/08/17 17:55*	*50*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1016	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1221	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1221	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1232	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1232	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1242	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1242	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1248	**180**		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1248	**170**		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1254	**180**		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1254	**150**		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1260	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50
PCB-1260	<25		25	12	mg/Kg		03/07/17 14:02	03/09/17 14:05	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*0*	*D*	*62 - 121*	*03/07/17 14:02*	*03/09/17 14:05*	*50*
Tetrachloro-m-xylene	*0*	*D*	*62 - 121*	*03/07/17 14:02*	*03/09/17 14:05*	*50*
DCB Decachlorobiphenyl	*0*	*D*	*53 - 118*	*03/07/17 14:02*	*03/09/17 14:05*	*50*
DCB Decachlorobiphenyl	*0*	*D*	*53 - 118*	*03/07/17 14:02*	*03/09/17 14:05*	*50*

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	LCS or LCSD is outside acceptance limits.

GC Semi VOA

Qualifier	Qualifier Description
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

GC/MS VOA

Prep Batch: 374496

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-124554-1	MW-12-FP-03022017	Total/NA	Waste	5030B	
500-124554-1 - DL	MW-12-FP-03022017	Total/NA	Waste	5030B	
500-124554-1 - DL2	MW-12-FP-03022017	Total/NA	Waste	5030B	

Analysis Batch: 375465

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-124554-1	MW-12-FP-03022017	Total/NA	Waste	8260B	374496
500-124554-1 - DL	MW-12-FP-03022017	Total/NA	Waste	8260B	374496
MB 500-375465/7	Method Blank	Total/NA	Waste	8260B	
LCS 500-375465/5	Lab Control Sample	Total/NA	Waste	8260B	

Analysis Batch: 375635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-124554-1 - DL2	MW-12-FP-03022017	Total/NA	Waste	8260B	374496
MB 500-375635/6	Method Blank	Total/NA	Waste	8260B	
LCS 500-375635/4	Lab Control Sample	Total/NA	Waste	8260B	

GC/MS Semi VOA

Prep Batch: 374814

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-124554-1	MW-12-FP-03022017	Total/NA	Waste	3580A	
500-124554-1 - DL	MW-12-FP-03022017	Total/NA	Waste	3580A	
MB 500-374814/1-A	Method Blank	Total/NA	Waste	3580A	
LCS 500-374814/2-A	Lab Control Sample	Total/NA	Waste	3580A	
LCSD 500-374814/3-A	Lab Control Sample Dup	Total/NA	Waste	3580A	

Analysis Batch: 374842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-124554-1 - DL	MW-12-FP-03022017	Total/NA	Waste	8270D	374814
500-124554-1	MW-12-FP-03022017	Total/NA	Waste	8270D	374814
MB 500-374814/1-A	Method Blank	Total/NA	Waste	8270D	374814
LCS 500-374814/2-A	Lab Control Sample	Total/NA	Waste	8270D	374814
LCSD 500-374814/3-A	Lab Control Sample Dup	Total/NA	Waste	8270D	374814

GC Semi VOA

Prep Batch: 374749

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-124554-1	MW-12-FP-03022017	Total/NA	Waste	3580A	
MB 500-374749/1-A	Method Blank	Total/NA	Waste	3580A	
LCS 500-374749/2-A	Lab Control Sample	Total/NA	Waste	3580A	
LCSD 500-374749/3-A	Lab Control Sample Dup	Total/NA	Waste	3580A	

Analysis Batch: 375068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-124554-1	MW-12-FP-03022017	Total/NA	Waste	8082A	374749
MB 500-374749/1-A	Method Blank	Total/NA	Waste	8082A	374749
LCS 500-374749/2-A	Lab Control Sample	Total/NA	Waste	8082A	374749
LCSD 500-374749/3-A	Lab Control Sample Dup	Total/NA	Waste	8082A	374749

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Waste **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(71-127)	(75-120)	(71-120)	(70-120)
500-124554-1	MW-12-FP-03022017	105	99	95	95
500-124554-1 - DL	MW-12-FP-03022017	104	101	102	94
500-124554-1 - DL2	MW-12-FP-03022017	105	97	92	94
LCS 500-375465/5	Lab Control Sample	99	102	96	97
LCS 500-375635/4	Lab Control Sample	103	102	88	97
MB 500-375465/7	Method Blank	101	100	101	97
MB 500-375635/6	Method Blank	105	100	93	93

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Waste **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		2FP	PHL	NBZ	FBP	TBP	TPH
Lab Sample ID	Client Sample ID	(40-130)	(36-123)	(33-124)	(42-115)	(25-130)	(25-150)
500-124554-1 - DL	MW-12-FP-03022017	0 D	0 D	0 D	0 D	0 D	0 D
500-124554-1	MW-12-FP-03022017	36 X	226 X	166 X	120 X	102	126
LCS 500-374814/2-A	Lab Control Sample	118	111	95	87	85	98
LCSD 500-374814/3-A	Lab Control Sample Dup	113	105	91	83	80	95
MB 500-374814/1-A	Method Blank	115	100	91	89	69	98

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPH = Terphenyl-d14 (Surr)

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Waste **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		TCX1	TCX2	DCB1	DCB2
Lab Sample ID	Client Sample ID	(62-121)	(62-121)	(53-118)	(53-118)
500-124554-1	MW-12-FP-03022017	0 D	0 D	0 D	0 D
LCS 500-374749/2-A	Lab Control Sample	104	104	102	98
LCSD 500-374749/3-A	Lab Control Sample Dup	93	91	89	86
MB 500-374749/1-A	Method Blank	96	97	91	91

Surrogate Legend

TCX = Tetrachloro-m-xylene
DCB = DCB Decachlorobiphenyl

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-375465/7
Matrix: Waste
Analysis Batch: 375465

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	<0.0020		0.0020	0.00067	mg/Kg			03/13/17 10:38	1
Chloromethane	<0.0010		0.0010	0.00032	mg/Kg			03/13/17 10:38	1
Vinyl chloride	<0.00050		0.00050	0.00026	mg/Kg			03/13/17 10:38	1
Bromomethane	<0.0020		0.0020	0.00080	mg/Kg			03/13/17 10:38	1
Chloroethane	<0.0010		0.0010	0.00050	mg/Kg			03/13/17 10:38	1
Trichlorofluoromethane	<0.0010		0.0010	0.00043	mg/Kg			03/13/17 10:38	1
1,1-Dichloroethene	<0.0010		0.0010	0.00039	mg/Kg			03/13/17 10:38	1
1,1,2-Trichloro-1,2,2-trifluoroethane	<0.0010		0.0010	0.00046	mg/Kg			03/13/17 10:38	1
Acetone	<0.0050		0.0050	0.0017	mg/Kg			03/13/17 10:38	1
Carbon disulfide	<0.0020		0.0020	0.00080	mg/Kg			03/13/17 10:38	1
Methyl acetate	<0.0050		0.0050	0.0020	mg/Kg			03/13/17 10:38	1
Methylene Chloride	<0.0050		0.0050	0.0016	mg/Kg			03/13/17 10:38	1
trans-1,2-Dichloroethene	<0.0010		0.0010	0.00035	mg/Kg			03/13/17 10:38	1
Methyl tert-butyl ether	<0.0010		0.0010	0.00039	mg/Kg			03/13/17 10:38	1
1,1-Dichloroethane	<0.0010		0.0010	0.00041	mg/Kg			03/13/17 10:38	1
cis-1,2-Dichloroethene	<0.0010		0.0010	0.00041	mg/Kg			03/13/17 10:38	1
Methyl Ethyl Ketone	<0.0050		0.0050	0.0021	mg/Kg			03/13/17 10:38	1
Chloroform	<0.0020		0.0020	0.00037	mg/Kg			03/13/17 10:38	1
1,1,1-Trichloroethane	<0.0010		0.0010	0.00038	mg/Kg			03/13/17 10:38	1
Cyclohexane	<0.0010		0.0010	0.00048	mg/Kg			03/13/17 10:38	1
Carbon tetrachloride	<0.0010		0.0010	0.00038	mg/Kg			03/13/17 10:38	1
Benzene	<0.00025		0.00025	0.00015	mg/Kg			03/13/17 10:38	1
1,2-Dichloroethane	<0.0010		0.0010	0.00039	mg/Kg			03/13/17 10:38	1
Trichloroethene	<0.00050		0.00050	0.00016	mg/Kg			03/13/17 10:38	1
Methylcyclohexane	<0.0010		0.0010	0.00032	mg/Kg			03/13/17 10:38	1
1,2-Dichloropropane	<0.0010		0.0010	0.00043	mg/Kg			03/13/17 10:38	1
Bromodichloromethane	<0.0010		0.0010	0.00037	mg/Kg			03/13/17 10:38	1
cis-1,3-Dichloropropene	<0.0010		0.0010	0.00042	mg/Kg			03/13/17 10:38	1
methyl isobutyl ketone	<0.0050		0.0050	0.0022	mg/Kg			03/13/17 10:38	1
Toluene	<0.00025		0.00025	0.00015	mg/Kg			03/13/17 10:38	1
trans-1,3-Dichloropropene	<0.0010		0.0010	0.00036	mg/Kg			03/13/17 10:38	1
1,1,2-Trichloroethane	<0.0010		0.0010	0.00035	mg/Kg			03/13/17 10:38	1
Tetrachloroethene	<0.0010		0.0010	0.00037	mg/Kg			03/13/17 10:38	1
2-Hexanone	<0.0050		0.0050	0.0016	mg/Kg			03/13/17 10:38	1
Dibromochloromethane	<0.0010		0.0010	0.00049	mg/Kg			03/13/17 10:38	1
1,2-Dibromoethane	<0.0010		0.0010	0.00039	mg/Kg			03/13/17 10:38	1
Chlorobenzene	<0.0010		0.0010	0.00039	mg/Kg			03/13/17 10:38	1
Ethylbenzene	<0.00025		0.00025	0.00018	mg/Kg			03/13/17 10:38	1
Xylenes, Total	<0.00050		0.00050	0.00022	mg/Kg			03/13/17 10:38	1
Styrene	<0.0010		0.0010	0.00039	mg/Kg			03/13/17 10:38	1
Bromoform	<0.0010		0.0010	0.00048	mg/Kg			03/13/17 10:38	1
Isopropylbenzene	<0.0010		0.0010	0.00038	mg/Kg			03/13/17 10:38	1
1,1,2,2-Tetrachloroethane	<0.0010		0.0010	0.00040	mg/Kg			03/13/17 10:38	1
1,3-Dichlorobenzene	<0.0010		0.0010	0.00040	mg/Kg			03/13/17 10:38	1
1,4-Dichlorobenzene	<0.0010		0.0010	0.00036	mg/Kg			03/13/17 10:38	1
1,2-Dichlorobenzene	<0.0010		0.0010	0.00033	mg/Kg			03/13/17 10:38	1
1,2-Dibromo-3-Chloropropane	<0.0050		0.0050	0.0020	mg/Kg			03/13/17 10:38	1
1,2,4-Trichlorobenzene	<0.0010		0.0010	0.00034	mg/Kg			03/13/17 10:38	1

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		71 - 127		03/13/17 10:38	1
Toluene-d8 (Surr)	100		75 - 120		03/13/17 10:38	1
4-Bromofluorobenzene (Surr)	101		71 - 120		03/13/17 10:38	1
Dibromofluoromethane	97		70 - 120		03/13/17 10:38	1

Lab Sample ID: LCS 500-375465/5
Matrix: Waste
Analysis Batch: 375465

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dichlorodifluoromethane	0.0500	0.0353		mg/Kg		71	51 - 140
Chloromethane	0.0500	0.0393		mg/Kg		79	60 - 140
Vinyl chloride	0.0500	0.0386		mg/Kg		77	70 - 126
Bromomethane	0.0500	0.0304		mg/Kg		61	40 - 150
Chloroethane	0.0500	0.0351		mg/Kg		70	60 - 139
Trichlorofluoromethane	0.0500	0.0573		mg/Kg		115	60 - 126
1,1-Dichloroethene	0.0500	0.0423		mg/Kg		85	70 - 125
1,1,2-Trichloro-1,2,2-trifluoroetha ne	0.0500	0.0463		mg/Kg		93	57 - 141
Acetone	0.0500	0.0358		mg/Kg		72	37 - 141
Carbon disulfide	0.0500	0.0405		mg/Kg		81	68 - 125
Methyl acetate	0.250	0.204		mg/Kg		82	60 - 148
Methylene Chloride	0.0500	0.0411		mg/Kg		82	68 - 125
trans-1,2-Dichloroethene	0.0500	0.0421		mg/Kg		84	70 - 125
Methyl tert-butyl ether	0.0500	0.0418		mg/Kg		84	67 - 125
1,1-Dichloroethane	0.0500	0.0399		mg/Kg		80	70 - 125
cis-1,2-Dichloroethene	0.0500	0.0416		mg/Kg		83	70 - 125
Methyl Ethyl Ketone	0.0500	0.0384		mg/Kg		77	52 - 142
Chloroform	0.0500	0.0424		mg/Kg		85	70 - 125
1,1,1-Trichloroethane	0.0500	0.0439		mg/Kg		88	70 - 125
Cyclohexane	0.0500	0.0407		mg/Kg		81	56 - 149
Carbon tetrachloride	0.0500	0.0425		mg/Kg		85	70 - 125
Benzene	0.0500	0.0413		mg/Kg		83	70 - 125
1,2-Dichloroethane	0.0500	0.0414		mg/Kg		83	70 - 125
Trichloroethene	0.0500	0.0429		mg/Kg		86	70 - 125
Methylcyclohexane	0.0500	0.0445		mg/Kg		89	70 - 127
1,2-Dichloropropane	0.0500	0.0400		mg/Kg		80	70 - 125
Bromodichloromethane	0.0500	0.0414		mg/Kg		83	70 - 125
cis-1,3-Dichloropropene	0.0500	0.0419		mg/Kg		84	70 - 125
methyl isobutyl ketone	0.0500	0.0440		mg/Kg		88	47 - 140
Toluene	0.0500	0.0441		mg/Kg		88	70 - 125
trans-1,3-Dichloropropene	0.0500	0.0416		mg/Kg		83	70 - 125
1,1,2-Trichloroethane	0.0500	0.0434		mg/Kg		87	70 - 125
Tetrachloroethene	0.0500	0.0451		mg/Kg		90	70 - 125
2-Hexanone	0.0500	0.0422		mg/Kg		84	49 - 139
Dibromochloromethane	0.0500	0.0426		mg/Kg		85	66 - 125
1,2-Dibromoethane	0.0500	0.0443		mg/Kg		89	70 - 125
Chlorobenzene	0.0500	0.0432		mg/Kg		86	70 - 125
Ethylbenzene	0.0500	0.0452		mg/Kg		90	70 - 125
Xylenes, Total	0.100	0.0871		mg/Kg		87	70 - 125
Styrene	0.0500	0.0435		mg/Kg		87	70 - 125
Bromoform	0.0500	0.0384		mg/Kg		77	54 - 128
Isopropylbenzene	0.0500	0.0436		mg/Kg		87	70 - 125
1,1,2,2-Tetrachloroethane	0.0500	0.0418		mg/Kg		84	68 - 125

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-375465/5
Matrix: Waste
Analysis Batch: 375465

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,3-Dichlorobenzene	0.0500	0.0432		mg/Kg		86	70 - 125
1,4-Dichlorobenzene	0.0500	0.0428		mg/Kg		86	70 - 125
1,2-Dichlorobenzene	0.0500	0.0431		mg/Kg		86	70 - 125
1,2-Dibromo-3-Chloropropane	0.0500	0.0393		mg/Kg		79	51 - 125
1,2,4-Trichlorobenzene	0.0500	0.0403		mg/Kg		81	64 - 126

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*71 - 127*
Toluene-d8 (Surr)	*102*		*75 - 120*
4-Bromofluorobenzene (Surr)	*96*		*71 - 120*
Dibromofluoromethane	*97*		*70 - 120*

Lab Sample ID: MB 500-375635/6
Matrix: Waste
Analysis Batch: 375635

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	<0.0020		0.0020	0.00067	mg/Kg			03/14/17 10:01	1
Chloromethane	<0.0010		0.0010	0.00032	mg/Kg			03/14/17 10:01	1
Vinyl chloride	<0.00050		0.00050	0.00026	mg/Kg			03/14/17 10:01	1
Bromomethane	<0.0020		0.0020	0.00080	mg/Kg			03/14/17 10:01	1
Chloroethane	<0.0010		0.0010	0.00050	mg/Kg			03/14/17 10:01	1
Trichlorofluoromethane	<0.0010		0.0010	0.00043	mg/Kg			03/14/17 10:01	1
1,1-Dichloroethene	<0.0010		0.0010	0.00039	mg/Kg			03/14/17 10:01	1
1,1,2-Trichloro-1,2,2-trifluoroethane	<0.0010		0.0010	0.00046	mg/Kg			03/14/17 10:01	1
Acetone	<0.0050		0.0050	0.0017	mg/Kg			03/14/17 10:01	1
Carbon disulfide	<0.0020		0.0020	0.00080	mg/Kg			03/14/17 10:01	1
Methyl acetate	<0.0050		0.0050	0.0020	mg/Kg			03/14/17 10:01	1
Methylene Chloride	<0.0050		0.0050	0.0016	mg/Kg			03/14/17 10:01	1
trans-1,2-Dichloroethene	<0.0010		0.0010	0.00035	mg/Kg			03/14/17 10:01	1
Methyl tert-butyl ether	<0.0010		0.0010	0.00039	mg/Kg			03/14/17 10:01	1
1,1-Dichloroethane	<0.0010		0.0010	0.00041	mg/Kg			03/14/17 10:01	1
cis-1,2-Dichloroethene	<0.0010		0.0010	0.00041	mg/Kg			03/14/17 10:01	1
Methyl Ethyl Ketone	<0.0050		0.0050	0.0021	mg/Kg			03/14/17 10:01	1
Chloroform	<0.0020		0.0020	0.00037	mg/Kg			03/14/17 10:01	1
1,1,1-Trichloroethane	<0.0010		0.0010	0.00038	mg/Kg			03/14/17 10:01	1
Cyclohexane	<0.0010		0.0010	0.00048	mg/Kg			03/14/17 10:01	1
Carbon tetrachloride	<0.0010		0.0010	0.00038	mg/Kg			03/14/17 10:01	1
Benzene	<0.00025		0.00025	0.00015	mg/Kg			03/14/17 10:01	1
1,2-Dichloroethane	<0.0010		0.0010	0.00039	mg/Kg			03/14/17 10:01	1
Trichloroethene	<0.00050		0.00050	0.00016	mg/Kg			03/14/17 10:01	1
Methylcyclohexane	<0.0010		0.0010	0.00032	mg/Kg			03/14/17 10:01	1
1,2-Dichloropropane	<0.0010		0.0010	0.00043	mg/Kg			03/14/17 10:01	1
Bromodichloromethane	<0.0010		0.0010	0.00037	mg/Kg			03/14/17 10:01	1
cis-1,3-Dichloropropene	<0.0010		0.0010	0.00042	mg/Kg			03/14/17 10:01	1
methyl isobutyl ketone	<0.0050		0.0050	0.0022	mg/Kg			03/14/17 10:01	1
Toluene	<0.00025		0.00025	0.00015	mg/Kg			03/14/17 10:01	1
trans-1,3-Dichloropropene	<0.0010		0.0010	0.00036	mg/Kg			03/14/17 10:01	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 500-375635/6
Matrix: Waste
Analysis Batch: 375635

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloroethane	<0.0010		0.0010	0.00035	mg/Kg			03/14/17 10:01	1
Tetrachloroethene	<0.0010		0.0010	0.00037	mg/Kg			03/14/17 10:01	1
2-Hexanone	<0.0050		0.0050	0.0016	mg/Kg			03/14/17 10:01	1
Dibromochloromethane	<0.0010		0.0010	0.00049	mg/Kg			03/14/17 10:01	1
1,2-Dibromoethane	<0.0010		0.0010	0.00039	mg/Kg			03/14/17 10:01	1
Chlorobenzene	<0.0010		0.0010	0.00039	mg/Kg			03/14/17 10:01	1
Ethylbenzene	<0.00025		0.00025	0.00018	mg/Kg			03/14/17 10:01	1
Xylenes, Total	<0.00050		0.00050	0.00022	mg/Kg			03/14/17 10:01	1
Styrene	<0.0010		0.0010	0.00039	mg/Kg			03/14/17 10:01	1
Bromoform	<0.0010		0.0010	0.00048	mg/Kg			03/14/17 10:01	1
Isopropylbenzene	<0.0010		0.0010	0.00038	mg/Kg			03/14/17 10:01	1
1,1,2,2-Tetrachloroethane	<0.0010		0.0010	0.00040	mg/Kg			03/14/17 10:01	1
1,3-Dichlorobenzene	<0.0010		0.0010	0.00040	mg/Kg			03/14/17 10:01	1
1,4-Dichlorobenzene	<0.0010		0.0010	0.00036	mg/Kg			03/14/17 10:01	1
1,2-Dichlorobenzene	<0.0010		0.0010	0.00033	mg/Kg			03/14/17 10:01	1
1,2-Dibromo-3-Chloropropane	<0.0050		0.0050	0.0020	mg/Kg			03/14/17 10:01	1
1,2,4-Trichlorobenzene	<0.0010		0.0010	0.00034	mg/Kg			03/14/17 10:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*71 - 127*		*03/14/17 10:01*	*1*
Toluene-d8 (Surr)	*100*		*75 - 120*		*03/14/17 10:01*	*1*
4-Bromofluorobenzene (Surr)	*93*		*71 - 120*		*03/14/17 10:01*	*1*
Dibromofluoromethane	*93*		*70 - 120*		*03/14/17 10:01*	*1*

Lab Sample ID: LCS 500-375635/4
Matrix: Waste
Analysis Batch: 375635

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dichlorodifluoromethane	0.0500	0.0362		mg/Kg		72	51 - 140
Chloromethane	0.0500	0.0372		mg/Kg		74	60 - 140
Vinyl chloride	0.0500	0.0457		mg/Kg		91	70 - 126
Bromomethane	0.0500	0.0593		mg/Kg		119	40 - 150
Chloroethane	0.0500	0.0506		mg/Kg		101	60 - 139
Trichlorofluoromethane	0.0500	0.0489		mg/Kg		98	60 - 126
1,1-Dichloroethene	0.0500	0.0523		mg/Kg		105	70 - 125
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0500	0.0571		mg/Kg		114	57 - 141
Acetone	0.0500	0.0426		mg/Kg		85	37 - 141
Carbon disulfide	0.0500	0.0499		mg/Kg		100	68 - 125
Methyl acetate	0.250	0.270		mg/Kg		108	60 - 148
Methylene Chloride	0.0500	0.0532		mg/Kg		106	68 - 125
trans-1,2-Dichloroethene	0.0500	0.0522		mg/Kg		104	70 - 125
Methyl tert-butyl ether	0.0500	0.0542		mg/Kg		108	67 - 125
1,1-Dichloroethane	0.0500	0.0540		mg/Kg		108	70 - 125
cis-1,2-Dichloroethene	0.0500	0.0523		mg/Kg		105	70 - 125
Methyl Ethyl Ketone	0.0500	0.0512		mg/Kg		102	52 - 142
Chloroform	0.0500	0.0531		mg/Kg		106	70 - 125

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-375635/4
Matrix: Waste
Analysis Batch: 375635

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	0.0500	0.0545		mg/Kg		109	70 - 125
Cyclohexane	0.0500	0.0554		mg/Kg		111	56 - 149
Carbon tetrachloride	0.0500	0.0543		mg/Kg		109	70 - 125
Benzene	0.0500	0.0529		mg/Kg		106	70 - 125
1,2-Dichloroethane	0.0500	0.0562		mg/Kg		112	70 - 125
Trichloroethene	0.0500	0.0571		mg/Kg		114	70 - 125
Methylcyclohexane	0.0500	0.0580		mg/Kg		116	70 - 127
1,2-Dichloropropane	0.0500	0.0532		mg/Kg		106	70 - 125
Bromodichloromethane	0.0500	0.0510		mg/Kg		102	70 - 125
cis-1,3-Dichloropropene	0.0500	0.0527		mg/Kg		105	70 - 125
methyl isobutyl ketone	0.0500	0.0508		mg/Kg		102	47 - 140
Toluene	0.0500	0.0562		mg/Kg		112	70 - 125
trans-1,3-Dichloropropene	0.0500	0.0515		mg/Kg		103	70 - 125
1,1,2-Trichloroethane	0.0500	0.0554		mg/Kg		111	70 - 125
Tetrachloroethene	0.0500	0.0589		mg/Kg		118	70 - 125
2-Hexanone	0.0500	0.0498		mg/Kg		100	49 - 139
Dibromochloromethane	0.0500	0.0533		mg/Kg		107	66 - 125
1,2-Dibromoethane	0.0500	0.0544		mg/Kg		109	70 - 125
Chlorobenzene	0.0500	0.0553		mg/Kg		111	70 - 125
Ethylbenzene	0.0500	0.0567		mg/Kg		113	70 - 125
Xylenes, Total	0.100	0.111		mg/Kg		111	70 - 125
Styrene	0.0500	0.0561		mg/Kg		112	70 - 125
Bromoform	0.0500	0.0497		mg/Kg		99	54 - 128
Isopropylbenzene	0.0500	0.0509		mg/Kg		102	70 - 125
1,1,2,2-Tetrachloroethane	0.0500	0.0511		mg/Kg		102	68 - 125
1,3-Dichlorobenzene	0.0500	0.0515		mg/Kg		103	70 - 125
1,4-Dichlorobenzene	0.0500	0.0523		mg/Kg		105	70 - 125
1,2-Dichlorobenzene	0.0500	0.0526		mg/Kg		105	70 - 125
1,2-Dibromo-3-Chloropropane	0.0500	0.0445		mg/Kg		89	51 - 125
1,2,4-Trichlorobenzene	0.0500	0.0617		mg/Kg		123	64 - 126

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*71 - 127*
Toluene-d8 (Surr)	*102*		*75 - 120*
4-Bromofluorobenzene (Surr)	*88*		*71 - 120*
Dibromofluoromethane	*97*		*70 - 120*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-374814/1-A
Matrix: Waste
Analysis Batch: 374842

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 374814

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzaldehyde	<200		200	100	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Phenol	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Bis(2-chloroethyl)ether	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2-Chlorophenol	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 500-374814/1-A
Matrix: Waste
Analysis Batch: 374842

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 374814

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylphenol	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2,2'-oxybis[1-chloropropane]	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Acetophenone	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
N-Nitrosodi-n-propylamine	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Hexachloroethane	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Nitrobenzene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Isophorone	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2-Nitrophenol	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2,4-Dimethylphenol	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Bis(2-chloroethoxy)methane	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2,4-Dichlorophenol	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Naphthalene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
4-Chloroaniline	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Hexachlorobutadiene	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Caprolactam	<100		100	100	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
4-Chloro-3-methylphenol	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2-Methylnaphthalene	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Hexachlorocyclopentadiene	<200		200	100	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2,4,6-Trichlorophenol	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2,4,5-Trichlorophenol	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
1,1'-Biphenyl	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2-Chloronaphthalene	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2-Nitroaniline	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Dimethyl phthalate	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2,6-Dinitrotoluene	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Acenaphthylene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
3-Nitroaniline	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Acenaphthene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2,4-Dinitrophenol	<200		200	100	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
4-Nitrophenol	<200		200	100	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Dibenzofuran	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
2,4-Dinitrotoluene	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Diethyl phthalate	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Fluorene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
4-Chlorophenyl phenyl ether	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
4-Nitroaniline	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
4,6-Dinitro-2-methylphenol	<100		100	50	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
N-Nitrosodiphenylamine	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
4-Bromophenyl phenyl ether	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Hexachlorobenzene	<20		20	10	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Atrazine	<100		100	100	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Pentachlorophenol	<200		200	100	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Phenanthrene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Anthracene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Carbazole	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Di-n-butyl phthalate	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Fluoranthene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Pyrene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 500-374814/1-A
Matrix: Waste
Analysis Batch: 374842

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 374814

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butyl benzyl phthalate	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
3,3'-Dichlorobenzidine	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Benzo[a]anthracene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Chrysene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Bis(2-ethylhexyl) phthalate	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Di-n-octyl phthalate	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Benzo[b]fluoranthene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Benzo[k]fluoranthene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Benzo[a]pyrene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Indeno[1,2,3-cd]pyrene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Dibenz(a,h)anthracene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
Benzo[g,h,i]perylene	<10		10	5.0	mg/Kg		03/07/17 21:45	03/08/17 12:14	1
3 & 4 Methylphenol	<51		51	25	mg/Kg		03/07/17 21:45	03/08/17 12:14	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*115*		*40 - 130*	*03/07/17 21:45*	*03/08/17 12:14*	*1*
Phenol-d5 (Surr)	*100*		*36 - 123*	*03/07/17 21:45*	*03/08/17 12:14*	*1*
Nitrobenzene-d5 (Surr)	*91*		*33 - 124*	*03/07/17 21:45*	*03/08/17 12:14*	*1*
2-Fluorobiphenyl (Surr)	*89*		*42 - 115*	*03/07/17 21:45*	*03/08/17 12:14*	*1*
2,4,6-Tribromophenol (Surr)	*69*		*25 - 130*	*03/07/17 21:45*	*03/08/17 12:14*	*1*
Terphenyl-d14 (Surr)	*98*		*25 - 150*	*03/07/17 21:45*	*03/08/17 12:14*	*1*

Lab Sample ID: LCS 500-374814/2-A
Matrix: Waste
Analysis Batch: 374842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 374814

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenol	80.0	93.0		mg/Kg		116	55 - 118
Bis(2-chloroethyl)ether	80.0	89.5		mg/Kg		112	53 - 116
2-Chlorophenol	80.0	83.0		mg/Kg		104	57 - 117
2-Methylphenol	80.0	88.4		mg/Kg		110	53 - 123
2,2'-oxybis[1-chloropropane]	80.0	93.3		mg/Kg		117	22 - 133
Acetophenone	80.0	77.8		mg/Kg		97	48 - 110
N-Nitrosodi-n-propylamine	80.0	83.6		mg/Kg		104	56 - 119
Hexachloroethane	80.0	85.2		mg/Kg		106	54 - 111
Nitrobenzene	80.0	86.5		mg/Kg		108	56 - 121
Isophorone	80.0	83.3		mg/Kg		104	54 - 120
2-Nitrophenol	80.0	91.6	J	mg/Kg		114	58 - 121
2,4-Dimethylphenol	80.0	83.5	J	mg/Kg		104	50 - 120
Bis(2-chloroethoxy)methane	80.0	84.0		mg/Kg		105	59 - 116
2,4-Dichlorophenol	80.0	80.9	J	mg/Kg		101	61 - 116
Naphthalene	80.0	77.5		mg/Kg		97	58 - 116
4-Chloroaniline	80.0	<100		mg/Kg		21	10 - 150
Hexachlorobutadiene	80.0	66.2		mg/Kg		83	56 - 120
4-Chloro-3-methylphenol	80.0	83.7	J	mg/Kg		105	59 - 117
2-Methylnaphthalene	80.0	73.5		mg/Kg		92	55 - 120
Hexachlorocyclopentadiene	80.0	<200		mg/Kg		57	10 - 116
2,4,6-Trichlorophenol	80.0	76.0	J	mg/Kg		95	50 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-374814/2-A
Matrix: Waste
Analysis Batch: 374842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 374814

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,5-Trichlorophenol	80.0	74.6	J	mg/Kg		93	42 - 119
2-Chloronaphthalene	80.0	79.3		mg/Kg		99	57 - 112
2-Nitroaniline	80.0	71.4		mg/Kg		89	52 - 121
Dimethyl phthalate	80.0	78.2		mg/Kg		98	60 - 112
2,6-Dinitrotoluene	80.0	80.2		mg/Kg		100	57 - 118
Acenaphthylene	80.0	79.9		mg/Kg		100	57 - 116
3-Nitroaniline	80.0	<100	*	mg/Kg		16	20 - 144
Acenaphthene	80.0	75.0		mg/Kg		94	52 - 113
2,4-Dinitrophenol	160	127	J	mg/Kg		79	10 - 110
4-Nitrophenol	160	148	J	mg/Kg		92	32 - 123
Dibenzofuran	80.0	79.6		mg/Kg		100	59 - 110
2,4-Dinitrotoluene	80.0	83.0		mg/Kg		104	59 - 119
Diethyl phthalate	80.0	74.9		mg/Kg		94	58 - 117
Fluorene	80.0	77.9		mg/Kg		97	56 - 115
4-Chlorophenyl phenyl ether	80.0	74.1		mg/Kg		93	61 - 111
4-Nitroaniline	80.0	<100	*	mg/Kg		54	55 - 146
4,6-Dinitro-2-methylphenol	160	143		mg/Kg		89	10 - 110
N-Nitrosodiphenylamine	80.0	53.8		mg/Kg		67	62 - 117
4-Bromophenyl phenyl ether	80.0	71.8		mg/Kg		90	61 - 124
Hexachlorobenzene	80.0	67.9		mg/Kg		85	62 - 126
Pentachlorophenol	160	117	J	mg/Kg		73	12 - 116
Phenanthrene	80.0	75.8		mg/Kg		95	58 - 125
Anthracene	80.0	76.5		mg/Kg		96	57 - 118
Carbazole	80.0	<51	*	mg/Kg		24	65 - 137
Di-n-butyl phthalate	80.0	78.4		mg/Kg		98	61 - 123
Fluoranthene	80.0	72.7		mg/Kg		91	61 - 124
Pyrene	80.0	82.7		mg/Kg		103	60 - 115
Butyl benzyl phthalate	80.0	89.7		mg/Kg		112	61 - 115
3,3'-Dichlorobenzidine	80.0	40.3	J	mg/Kg		50	40 - 110
Benzo[a]anthracene	80.0	75.1		mg/Kg		94	63 - 115
Chrysene	80.0	76.8		mg/Kg		96	63 - 118
Bis(2-ethylhexyl) phthalate	80.0	87.1		mg/Kg		109	62 - 117
Di-n-octyl phthalate	80.0	83.9		mg/Kg		105	58 - 129
Benzo[b]fluoranthene	80.0	85.7		mg/Kg		107	61 - 123
Benzo[k]fluoranthene	80.0	83.0		mg/Kg		104	59 - 125
Benzo[a]pyrene	80.0	82.0		mg/Kg		103	64 - 122
Indeno[1,2,3-cd]pyrene	80.0	80.3		mg/Kg		100	50 - 149
Dibenz(a,h)anthracene	80.0	80.0		mg/Kg		100	61 - 134
Benzo[g,h,i]perylene	80.0	84.2		mg/Kg		105	55 - 134
3 & 4 Methylphenol	80.0	83.0		mg/Kg		104	55 - 124

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorophenol (Surr)	*118*		*40 - 130*
Phenol-d5 (Surr)	*111*		*36 - 123*
Nitrobenzene-d5 (Surr)	*95*		*33 - 124*
2-Fluorobiphenyl (Surr)	*87*		*42 - 115*
2,4,6-Tribromophenol (Surr)	*85*		*25 - 130*
Terphenyl-d14 (Surr)	*98*		*25 - 150*

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Lab Sample ID: LCSD 500-374814/3-A
Matrix: Waste
Analysis Batch: 374842

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 374814

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenol	80.0	89.0		mg/Kg		111	55 - 118	4	30
Bis(2-chloroethyl)ether	80.0	85.3		mg/Kg		107	53 - 116	5	30
2-Chlorophenol	80.0	78.6		mg/Kg		98	57 - 117	6	30
2-Methylphenol	80.0	83.2		mg/Kg		104	53 - 123	6	30
2,2'-oxybis[1-chloropropane]	80.0	86.1		mg/Kg		108	22 - 133	8	30
Acetophenone	80.0	74.0		mg/Kg		93	48 - 110	5	30
N-Nitrosodi-n-propylamine	80.0	79.2		mg/Kg		99	56 - 119	5	30
Hexachloroethane	80.0	78.8		mg/Kg		99	54 - 111	8	30
Nitrobenzene	80.0	81.8		mg/Kg		102	56 - 121	5	30
Isophorone	80.0	79.4		mg/Kg		99	54 - 120	5	30
2-Nitrophenol	80.0	87.3	J	mg/Kg		109	58 - 121	5	30
2,4-Dimethylphenol	80.0	81.0	J	mg/Kg		101	50 - 120	3	30
Bis(2-chloroethoxy)methane	80.0	80.7		mg/Kg		101	59 - 116	4	30
2,4-Dichlorophenol	80.0	78.3	J	mg/Kg		98	61 - 116	3	30
Naphthalene	80.0	74.5		mg/Kg		93	58 - 116	4	30
4-Chloroaniline	80.0	<100		mg/Kg		17	10 - 150	18	30
Hexachlorobutadiene	80.0	65.4		mg/Kg		82	56 - 120	1	30
4-Chloro-3-methylphenol	80.0	82.3	J	mg/Kg		103	59 - 117	2	30
2-Methylnaphthalene	80.0	73.4		mg/Kg		92	55 - 120	0	30
Hexachlorocyclopentadiene	80.0	<200		mg/Kg		56	10 - 116	0	30
2,4,6-Trichlorophenol	80.0	73.7	J	mg/Kg		92	50 - 120	3	30
2,4,5-Trichlorophenol	80.0	72.0	J	mg/Kg		90	42 - 119	4	30
2-Chloronaphthalene	80.0	75.3		mg/Kg		94	57 - 112	5	30
2-Nitroaniline	80.0	70.4		mg/Kg		88	52 - 121	1	30
Dimethyl phthalate	80.0	74.8		mg/Kg		93	60 - 112	5	30
2,6-Dinitrotoluene	80.0	77.8		mg/Kg		97	57 - 118	3	30
Acenaphthylene	80.0	76.8		mg/Kg		96	57 - 116	4	30
3-Nitroaniline	80.0	<100	*	mg/Kg		16	20 - 144	5	30
Acenaphthene	80.0	70.7		mg/Kg		88	52 - 113	6	30
2,4-Dinitrophenol	160	125	J	mg/Kg		78	10 - 110	1	30
4-Nitrophenol	160	138	J	mg/Kg		86	32 - 123	7	30
Dibenzofuran	80.0	74.4		mg/Kg		93	59 - 110	7	30
2,4-Dinitrotoluene	80.0	78.1		mg/Kg		98	59 - 119	6	30
Diethyl phthalate	80.0	70.6		mg/Kg		88	58 - 117	6	30
Fluorene	80.0	74.5		mg/Kg		93	56 - 115	4	30
4-Chlorophenyl phenyl ether	80.0	70.6		mg/Kg		88	61 - 111	5	30
4-Nitroaniline	80.0	<100	*	mg/Kg		47	55 - 146	14	30
4,6-Dinitro-2-methylphenol	160	138		mg/Kg		86	10 - 110	4	30
N-Nitrosodiphenylamine	80.0	52.3		mg/Kg		65	62 - 117	3	30
4-Bromophenyl phenyl ether	80.0	69.0		mg/Kg		86	61 - 124	4	30
Hexachlorobenzene	80.0	65.1		mg/Kg		81	62 - 126	4	30
Pentachlorophenol	160	107	J	mg/Kg		67	12 - 116	9	30
Phenanthrene	80.0	72.1		mg/Kg		90	58 - 125	5	30
Anthracene	80.0	73.6		mg/Kg		92	57 - 118	4	30
Carbazole	80.0	<51	*	mg/Kg		26	65 - 137	7	30
Di-n-butyl phthalate	80.0	74.0		mg/Kg		92	61 - 123	6	30
Fluoranthene	80.0	68.8		mg/Kg		86	61 - 124	6	30
Pyrene	80.0	80.6		mg/Kg		101	60 - 115	3	30
Butyl benzyl phthalate	80.0	87.4		mg/Kg		109	61 - 115	3	30
3,3'-Dichlorobenzidine	80.0	38.0	J	mg/Kg		48	40 - 110	6	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 500-374814/3-A
Matrix: Waste
Analysis Batch: 374842

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 374814

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzo[a]anthracene			80.0	73.3		mg/Kg		92	63 - 115	2	30
Chrysene			80.0	75.2		mg/Kg		94	63 - 118	2	30
Bis(2-ethylhexyl) phthalate			80.0	84.3		mg/Kg		105	62 - 117	3	30
Di-n-octyl phthalate			80.0	80.1		mg/Kg		100	58 - 129	5	30
Benzo[b]fluoranthene			80.0	84.7		mg/Kg		106	61 - 123	1	30
Benzo[k]fluoranthene			80.0	80.2		mg/Kg		100	59 - 125	3	30
Benzo[a]pyrene			80.0	78.2		mg/Kg		98	64 - 122	5	30
Indeno[1,2,3-cd]pyrene			80.0	73.1		mg/Kg		91	50 - 149	9	30
Dibenz(a,h)anthracene			80.0	72.8		mg/Kg		91	61 - 134	9	30
Benzo[g,h,i]perylene			80.0	77.4		mg/Kg		97	55 - 134	8	30
3 & 4 Methylphenol			80.0	79.2		mg/Kg		99	55 - 124	5	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorophenol (Surr)	*113*		*40 - 130*
Phenol-d5 (Surr)	*105*		*36 - 123*
Nitrobenzene-d5 (Surr)	*91*		*33 - 124*
2-Fluorobiphenyl (Surr)	*83*		*42 - 115*
2,4,6-Tribromophenol (Surr)	*80*		*25 - 130*
Terphenyl-d14 (Surr)	*95*		*25 - 150*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 500-374749/1-A
Matrix: Waste
Analysis Batch: 375068

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 374749

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1016	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1221	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1221	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1232	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1232	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1242	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1242	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1248	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1248	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1254	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1254	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1260	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1
PCB-1260	<0.50		0.50	0.25	mg/Kg		03/07/17 14:02	03/09/17 13:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*96*		*62 - 121*	*03/07/17 14:02*	*03/09/17 13:19*	*1*
Tetrachloro-m-xylene	*97*		*62 - 121*	*03/07/17 14:02*	*03/09/17 13:19*	*1*
DCB Decachlorobiphenyl	*91*		*53 - 118*	*03/07/17 14:02*	*03/09/17 13:19*	*1*
DCB Decachlorobiphenyl	*91*		*53 - 118*	*03/07/17 14:02*	*03/09/17 13:19*	*1*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: LCS 500-374749/2-A
Matrix: Waste
Analysis Batch: 375068

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 374749

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
PCB-1016	5.00	5.53		mg/Kg		111	60 - 118
PCB-1016	5.00	5.08		mg/Kg		102	60 - 118
PCB-1260	5.00	5.59		mg/Kg		112	66 - 125
PCB-1260	5.00	5.33		mg/Kg		107	66 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*104*		*62 - 121*
Tetrachloro-m-xylene	*104*		*62 - 121*
DCB Decachlorobiphenyl	*102*		*53 - 118*
DCB Decachlorobiphenyl	*98*		*53 - 118*

Lab Sample ID: LCSD 500-374749/3-A
Matrix: Waste
Analysis Batch: 375068

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 374749

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PCB-1016	5.00	4.70		mg/Kg		94	60 - 118	16	30
PCB-1016	5.00	4.33		mg/Kg		87	60 - 118	16	30
PCB-1260	5.00	4.83		mg/Kg		97	66 - 125	15	30
PCB-1260	5.00	4.61		mg/Kg		92	66 - 125	14	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*93*		*62 - 121*
Tetrachloro-m-xylene	*91*		*62 - 121*
DCB Decachlorobiphenyl	*89*		*53 - 118*
DCB Decachlorobiphenyl	*86*		*53 - 118*

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Client Sample ID: MW-12-FP-03022017

Date Collected: 03/02/17 10:10
Date Received: 03/02/17 11:34

Lab Sample ID: 500-124554-1

Matrix: Waste

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			374496	03/05/17 17:07	WRE	TAL CHI
Total/NA	Analysis	8260B		5000	375465	03/13/17 14:13	PMF	TAL CHI
Total/NA	Prep	5030B	DL		374496	03/05/17 17:07	WRE	TAL CHI
Total/NA	Analysis	8260B	DL	50000	375465	03/13/17 14:40	PMF	TAL CHI
Total/NA	Prep	5030B	DL2		374496	03/05/17 17:07	WRE	TAL CHI
Total/NA	Analysis	8260B	DL2	500000	375635	03/14/17 11:17	PMF	TAL CHI
Total/NA	Prep	3580A	DL		374814	03/07/17 21:45	LLH	TAL CHI
Total/NA	Analysis	8270D	DL	50	374842	03/08/17 17:55	AJD	TAL CHI
Total/NA	Prep	3580A			374814	03/07/17 21:45	LLH	TAL CHI
Total/NA	Analysis	8270D		10	374842	03/08/17 18:51	AJD	TAL CHI
Total/NA	Prep	3580A			374749	03/07/17 14:02	JJH	TAL CHI
Total/NA	Analysis	8082A		50	375068	03/09/17 14:05	BJH	TAL CHI

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Lake Calumet Cluster Site

TestAmerica Job ID: 500-124554-1

Laboratory: TestAmerica Chicago

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Illinois	NELAP	5	100201	04-30-17 *

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
8260B	5030B	Waste	Cyclohexane
8260B	5030B	Waste	Methyl acetate
8260B	5030B	Waste	Methylcyclohexane
8270D	3580A	Waste	1,1'-Biphenyl
8270D	3580A	Waste	Atrazine
8270D	3580A	Waste	Benzaldehyde
8270D	3580A	Waste	Caprolactam

* Certification renewal pending - certification considered valid.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

2417 Bond Street, University Park, IL 60484
Phone: 708.534.5200 Fax: 708.534.5211

Report To (optional)
Contact: Jack Kratzmeyer
Company: Arcadis
Address: 200 S. Michigan Ave
Address: Ste 2000
Phone: 312-575-3700
Fax:
E-Mail: Jack.Kratzmeyer@arcadis.com

Bill To (optional)
Contact:
Company:
Address:
Address:
Phone:
Fax:
PO#/Reference#

Chain of Custody Record

Lab Job #: 500-124554
Chain of Custody Number:
Page ____ of ____
Temperature °C of Cooler: 4.6

Client: Arcadis
Client Project #: CI001805.0002.00005
Project Name: LCCS
Project Location/State: Chicago, IL
Lab Project #: 50011099
Sampler: Ben Thurnhoffer
Lab PM: Therese Hargraves

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	Waste Oil SVOC (Preservative 8)	Waste Oil VOC (Preservative 8)	Waste Oil PCB (Preservative 8)							Comments
1		MW-12-FP-03022017	3/2/17	10:10	3	OL	1	1	1							

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days ___ 10 Days ___ 15 Days _____ Other
Requested Due Date _____

Sample Disposal
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Ben Thurnhoffer	Arcadis	3/2/2017	1134	[illegible]	TA-CHI	3/2/17	1134
Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Lab Courier
Shipped
Hand Delivered X

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments

Lab Comments:
500-124554 COC

TAL-4124 (0809)
3/16/2017

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 500-124554-1

Login Number: 124554
List Number: 1
Creator: Kelsey, Shawn M

List Source: TestAmerica Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.6c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	